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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,802	11/29/2001	Hideyoshi Horie	011606	9180

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EXAMINER

CHU, CHRIS C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 11/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/995,802

Applicant(s)

HORIE ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 - 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 5 and 7 - 12 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Request for Continued Examination***

1. A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 29, 2003 has been entered. An action on the RCE follows.

2. Applicant's amendment filed on July 8, 2003 has been received and entered in the case.

### ***Information Disclosure Statement***

3. The information disclosure statement filed on August 23, 2003 fails to comply with 37 CFR 1.97(c) because it lacks a statement as specified in 37 CFR 1.97(e) or it lacks the fee set forth in 37 CFR 1.17(p). It has been placed in the application file, but the information referred to therein has not been considered.

Since applicant has not responded to the statement in the above paragraph, the statement is maintained.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 - 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the term "preferable" is a relative term that renders the claim indefinite. The term "preferable" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by McCann (U.S. Pat. No. 5, 454, 002).

Regarding claim 1, McCann discloses in Figs. 14, column 9, lines 42 ~ 53 and column 10, lines 9 ~ 43 a semiconductor light emitting device comprising

- at least one semiconductor light emitting element (88) of edge-emission type, a first heat sink (110) and a second heat sink (126),

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- wherein at least a part of an electrode (110) for a first-conduction-type semiconductor of the semiconductor light emitting element is in thermally preferable joining contact with the first heat sink;
- at least a part of an electrode (124) for a second-conduction-type semiconductor of the semiconductor light emitting element is in thermally preferable joining contact with the second heat sink; and
- the first heat sink and the second heat sink are in thermally preferable joining contact with each other in a junction overlooking one of the two side planes which do not compose facets of a cavity in the semiconductor light emitting element.

Regarding claim 2, McCann discloses in Figs. 14 a portion of the electrode (at the right-side surface of 108) for the first-conduction-type semiconductor of the semiconductor light emitting element being not in contact with the first heat sink in the vicinity of the front facet of the element; and a portion of the electrode (at the bottom-side surface of 124) for the second-conduction-type semiconductor of the semiconductor light emitting element being in contact with the second heat sink in the vicinity of the front facet of the element.

Regarding claim 4, McCann discloses in Figs. 14 a surface of the second heat sink which is kept in contact with the semiconductor light emitting element having no electro-conductivity with any surface which is not kept in contact with the semiconductor light emitting element.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCann in view of Ishikura (JP 59-208788).

Regarding claim 3, McCann discloses the claimed invention except for the surface of the first heat sink which is kept in contact with the semiconductor light emitting element having an effective electro-conductivity with at least one surface which is not kept in contact with the semiconductor light emitting element. However, Ishikura discloses in Fig. 2 the surface of a first heat sink (9) which is kept in contact with the semiconductor light emitting element (7) having an effective electro-conductivity (11) with at least one surface which is not kept in contact with the semiconductor light emitting element. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify McCann by using the effective electro-conductivity as taught by Ishikura. The ordinary artisan would have been motivated to modify McCann in the manner described above for at least the purpose of increasing signal transition.

10. Claims 5 and 10 - 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCann in view of Hattori (U.S. Pat. No. 5, 544, 269).

McCann discloses in column 6, line 60 – column 7, line 7 a lead wire for introducing electric current to the semiconductor light emitting element and which is kept in contact with at least one of the group consisting of semiconductor light emitting element, the first heat sink and

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the second heat sink and the semiconductor light emitting element being a semiconductor laser diode. However, McCann does not disclose a plurality of lead wires in a portion where a pair of portions is not connected directly with each other, the first-conduction type being p-type, and the second conduction type being n-type and an optical fiber. Hattori teaches in Fig. 5, Fig. 10B, column 7, lines 15 ~ 17 and column 7, lines 44 ~ 46 a pair of portions not connected directly with each other being connected with each other with a plurality of lead wires (11), the first-conduction type being p-type, the second conduction type being n-type and the front facet thereof being connected to an optical fiber (5) so as to compose a semiconductor laser module, and the tip of the optical fiber (5) having a light condensation focusing function, and being processed so as to be optically coupled directly with the front facet of the semiconductor laser diode. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify McCann by using the plurality of lead wires, the first-conduction type being p-type, and the second conduction type being n-type and an optical fiber as taught by Hattori. The ordinary artisan would have been motivated to modify McCann in the manner described above for at least the purpose of providing high external quantum efficiency (read PURPOSE, lines 1 ~ 3).

Furthermore, McCann does not disclose the diameter of a lead wire being 35  $\mu\text{m}$  or less. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the diameter of a lead wire being 35  $\mu\text{m}$  or less, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. The ordinary artisan

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would have been motivated to modify McCann in the manner described above for at least the purpose of decreasing manufacture cost.

11. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCann in view of Hoffman et al. (U.S. Pat. No. 5, 578, 869).

McCann discloses the claimed invention except for first and second adhesives. However, Hoffman et al. discloses in Fig. 3 and column 5, lines 12 ~ 20 at least a part of the electrode (18) for the first-conduction-type semiconductor (10) being in contact with a first heat sink (20), interposed with a first adhesive (34); at least a part of the first heat sink being in contact with a second heat sink (42), interposed with a second adhesive (54); and the total weight of the second adhesive is five times or more heavier than the total weight of the first adhesive. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify McCann by using the first and second adhesives as taught by Hoffman et al. The ordinary artisan would have been motivated to modify McCann in the manner described above for at least the purpose of increasing reliability of the package.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCann in view of Oota (U.S. Pat. No. 6, 299, 056).

Regarding claim 9, McCann discloses the claimed invention except for at least one of the electrodes of the semiconductor light emitting element having an Au layer having a thickness of 30 to 100 nm. However, Oota discloses in column 4, lines 66 ~ column 5, lines 4 at least one of the electrodes of the semiconductor light emitting element having an Au layer with a thickness of



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30 to 100 nm. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify McCann by using the thickness of gold layer as taught by Oota. The ordinary artisan would have been motivated to modify McCann in the manner described above for at least the purpose of protecting the electrode (column 5, lines 15 ~ 18).

### ***Allowable Subject Matter***

13. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 6 contains allowable subject matter because none of references of record teach or suggest, either singularly or in combination, at least the limitation of a groove being provided in a vicinity of a junction of a first heat sink and a second heat sink, into which an adhesive is provided on a protrusion part of the second heat sink to join the first heat sink and the second heat sink; wherein the groove prevent an excessive adhesive from reaching the semiconductor light emitting element.

### ***Response to Arguments***

14. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

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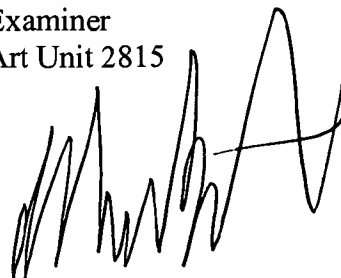
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu  
Examiner  
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A handwritten signature in black ink, appearing to read 'Bradley Baumeister', written over a series of horizontal lines.

**BRADLEY BAUMEISTER  
PRIMARY EXAMINER**

c.c.  
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